

What is Claimed is:

1. A method for detecting molecules expressing a selected epitope in a sample comprising:

(a) immobilizing a molecule expressing a selected epitope in a sample to a selected surface;

(b) contacting the surface with an epitope detector so that the epitope detector binds to immobilized molecules on the surface, said epitope detector comprising an oligonucleotide attached to a monoclonal antibody for the selected epitope, a single chain Fv for the epitope or a constrained epitope specific CDR, CDR mimetic or engineered CDR structure;

(c) amplifying the oligonucleotide of said epitope detector;

(d) contacting the amplified oligonucleotide with a fluorescent dye which stains the oligonucleotide; and

(e) measuring fluorescence emitted from the stained oligonucleotide which is indicative of epitope detector bound to the surface and molecules expressing the selected epitope in the sample.

2. A kit for the detection of molecules expressing a selected epitope via fluorescence comprising:

(a) an epitope detector comprising an oligonucleotide attached to a monoclonal antibody for the selected epitope, a single chain Fv for the epitope or a constrained epitope specific CDR, CDR mimetic or engineered CDR structure;

(b) an RNA polymerase;

(c) an amplification reaction buffer;

and

(d) a fluorescent dye.

3. The kit of claim 2 wherein the oligonucleotide of the epitope detector is coupled to biotin and the monoclonal antibody, single chain Fv or constrained epitope specific

SUB  
A1

0097745-104501

CDR, CDR mimetic or engineered CDR structures is coupled to streptavidin so that attachment of the oligonucleotide to the monoclonal antibody, single chain Fv or constrained epitope specific CDR, CDR mimetic or engineered CDR structure to form  
5 the epitope detector is via the biotin-streptavidin complex.

4. A method for profiling proteins in a cell lysate comprising:

(a) adding to the cell lysate a mixture of epitope detectors comprising monoclonal antibodies for selected  
10 epitopes, single chain Fvs for selected epitopes or constrained epitope specific CDRs, CDR mimetics or engineered CDR structures conjugated with cDNAs of different lengths;

(b) performing RNA amplification;

(c) separating the RNAs via electrophoresis; and

15 (d) visualizing the RNA products via fluorescence so that the profile of proteins in the lysate can be determined.

5. A kit for profiling proteins comprising:

(a) a mixture of epitope detectors comprising monoclonal antibodies for selected epitopes, single chain Fvs  
20 for selected epitopes or constrained epitope specific CDRs, CDR mimetics or engineered CDR structures conjugated with cDNAs of different lengths;

(b) an RNA polymerase;

(c) an amplification reaction buffer;

25 and

(d) a fluorescent dye.

6. The kit of claim 5 wherein oligonucleotides of the epitope detectors are coupled to biotin and the monoclonal antibodies, single chain Fvs or constrained  
30 epitope specific CDRs, CDR mimetics or engineered CDR structures are coupled to streptavidin so that attachment of the oligonucleotides to the monoclonal antibodies, single

0997746-104501

chain Fvs or constrained epitope specific CDRs, CDR mimetics or engineered CDR structures to form the epitope detectors is via the biotin-streptavidin complex.

7. A method for developing a two-component system  
5 for monitoring interaction of molecules *in vitro* comprising:
- (a) immobilizing a first molecule to a solid support;
  - (b) adding a second molecule which interacts with the first molecule to the solid support;
  - (c) adding a universal epitope detector conjugated  
10 with a polymerase promoter-containing oligonucleotide to the solid support;
  - (d) performing RNA amplification;
  - (e) contacting the amplified oligonucleotide with a fluorescent dye which stains the oligonucleotide; and  
15 (f) measuring fluorescence emitted from the stained oligonucleotide which is indicative of binding of the first molecule to the second molecule.

8. The method of claim 7 wherein said first and second molecules are proteins, sugars, carbohydrates, DNA,  
20 RNA, or peptides with structural conformations.

9. A method of monitoring interaction of molecules *in vitro* comprising:
- (a) developing a two-component system in accordance with the method of claim 7;
  - 25 (b) adding a third molecule to the two-component interaction system; and
  - (c) monitoring effects of the third molecule on the binding and interaction of said first and second molecules of said two-component system via measuring changes in  
30 fluorescence wherein a positive change in fluorescence is indicative of the third molecule facilitating binding of the first and second molecule and a negative change in

0097746-101501

fluorescence is indicative of the third molecule inhibiting binding of the first and second molecule.

10. The method of claim 9 wherein said third molecule comprises a ligand or a pharmaceutical drug.

5 11. A method for identifying a CDR, CDR mimetic or engineered CDR structure for use in an epitope detector or a therapeutic agent targeted to a receptor or protein interacting with the receptor, said method comprising screening a library of CDRs, CDR mimetics or engineered CDR  
10 structures to define a CDR, CDR mimetic or engineered CDR structure which binds a molecule with the epitope or the targeted receptor or protein.

12. The method of claim 11 wherein the library comprises CDR-streptavidin structures.

15 13. A therapeutic agent comprising a CDR or CDR mimetic identified in accordance with the method of claim 11.

14. The therapeutic agent of claim 12 wherein the CDR or CDR mimetic is reinserted into a humanized antibody or attached to an Fc.

0997746-101501